

## REMARKS/ARGUMENTS

Claims 25-28 and 31-36 are pending herein. Claims 29 and 30 have been canceled without prejudice or disclaimer. Claim 25 has been amended to include the subject matter of claim 29. Claim 25 has been further amended to clarify that the thickness of the bonding layer is not more than 0.5  $\mu\text{m}$  and the solvent used for the bonding layer consists essentially of an aqueous solvent, as respectively supported by original specification paragraphs [0033] and [0012], for example. Claims 31 and 33 have been amended to properly depend from claims 25 and 26, respectively.

1. Claims 25-28 were rejected under §102(b) over JP 56-152315. This rejection is moot in view of the addition of claim 29 to claim 25.

2. Claims 25-34 were rejected under §102(b) over JP Pub. No. 63-277589. To the extent that this rejection might be applied against the amended claims, it is respectfully traversed.

As discussed above, the subject matter of claim 29 has been added to claim 25. Pending independent claim 25 recites, among other things, a bonded article including a bonding layer interposed between first and second substrates. Pending claim 25 has been amended to clarify that the thickness of the bonding layer is not more than 0.5  $\mu\text{m}$  and a solvent used for the bonding layer consists essentially of an aqueous solvent. Applicants respectfully submit that JP '589, discussed below, does not disclose or suggest a bonding layer having a thickness of not more than 0.5  $\mu\text{m}$ , as is now recited in pending claim 25.

The present invention makes it possible to advantageously achieve a bonded structure having a thin bonding layer (i.e., not exceeding 0.5  $\mu\text{m}$  thick), while, in the same instance, assuring a desired bonding strength, even in the event that the bonded substrates include uneven bonding surfaces (see, e.g., original specification paragraph [0041]). Moreover, since

the bonding layer solvent is aqueous, organic remnants are not present in the final bonding layer structure. Furthermore, by using an aqueous solvent for the bonding layer, there can be a suppression of the generation of gases from the bonding layer which results from the use of organic solvents and causes variations and deteriorations in the strength of the bonding layer (see, e.g., original specification paragraph [0011]).

JP '589 discloses a support structure for growing a  $\text{LiTaO}_3$  single crystal from a seed crystal.  $\text{LiTaO}_3$  particles are mixed into a refractory cement 3, which is used to fix a portion of an  $\text{LiTaO}_3$  columnar seed crystal 2 to an  $\text{Al}_2\text{O}_3$  cylindrical support body 1. Applicants respectfully submit that the thickness of the bonding layer disclosed by JP '589 is at least as thick as the  $\text{LiTaO}_3$  powder particles remaining in the final structure of the refractory cement. As discussed above, in contrast to the refractory cement layer disclosed by JP '589, pending claim 25 now recites that the bonding layer has a thickness of not more than  $0.5\ \mu\text{m}$ . Applicants respectfully submit that the bonding layer of JP '589 has a thickness of more than  $0.5\ \mu\text{m}$ , again, due to  $\text{LiTaO}_3$  particles in the refractory cement layer.

In view of the all of the foregoing, reconsideration and withdrawal of the §102(b) rejection over JP '589 are respectfully requested.

3. Claims 25-36 were rejected under §102(b)/§103(a) over Japanese Pub. No. 8-234021. To the extent that this rejection might be applied against the amended claims, it is respectfully traversed.

JP '021 discloses the use of an organometallic compound as a starting material for producing a metal oxide in the bonding layer. A dehydrated organic solvent is used for the bonding agent in order to avoid the hydrolysis of the organometallic compound. Conversely, as discussed above, pending independent claim 25 now recites that the solvent used for the bonding layer consists essentially of an aqueous solvent. The claimed aqueous-based

bonding layer avoids the above-discussed problems associated with the use of organic solvents for adhesive layers, such as organic remnants remaining in the final structure of the adhesive layer and the generation of gases from the adhesive layer. The claimed aqueous-based bonding layer, therefore, produces a structurally distinct bonded structure as compared to the bonded structure of JP '021, which, again, employs an organic-based solvent for the adhesive layer.

In view of all of the foregoing, reconsideration and withdrawal of the §102(b)/§103(a) rejection over JP '021 are respectfully requested.

4. Claims 25-36 were rejected under §102(b)/§103(a) over WO 00/16140. To the extent that this rejection might be applied against the amended claims, it is respectfully traversed.

WO '140 discloses a periodically poled LiNbO<sub>3</sub> (PPLN) guiding lamina 10 directly bonded to LiTaO<sub>3</sub> laminas 20. Pending independent claim 25, however, recites that a bonding layer is interposed between first and second substrates to bond the substrate to one another. It is clear that WO '140 discloses the direct interfacial bonding of substrates to one another and, therefore, does not even remotely disclose or suggest a bonding layer, as claimed.

In view of all of the foregoing, reconsideration and withdrawal of the §102(b)/§103(a) rejection over WO '140 are respectfully requested.

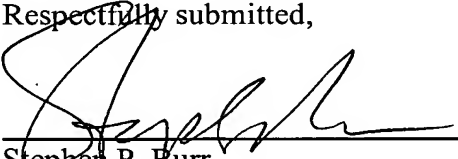
If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

June 14, 2004

Date

  
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